Participant List 27820 Medical Biofilm Techniques 2013

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Background:
I have a bachelor degree in Exercise and Sports Science and I am now studying my Master of Science in Human Biology. My knowledge about biofilm is rather limited, I have only heard about it in theory, and I am looking forward to try to work with it in practice. Furthermore I like the intense structure of the course, instead of following a course a whole semester I take this course so I have more time to focus on my Master Thesis.

Title of talk:
The interplay between glucagon and insulin signaling.

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Background:
In the last years I studied Biochemical Engineering with the main focus on Biotechnology at the Technical University of Dortmund. I finished my diploma thesis in May 2013. The research projects during my studies were focused on biotransformation and fermentative production of fine chemicals by recombinant *Escherichia coli*. My PhD studies will focus on the technical side of biofilms as self-immobilized biocatalysts and possible reactor concepts. As the application of biofilms is new to me, I would like to learn all about the available techniques for biofilm investigation.

Title of talk:
Potential of *Pseudomonas* sp. biofilms for application in productive biocatalysis

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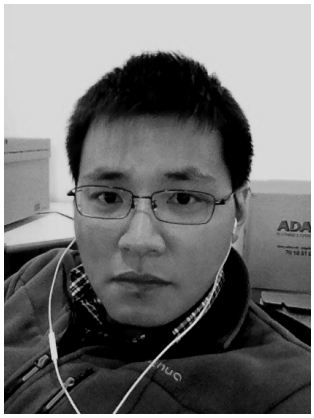

Background:
I am an international PhD student at Marine Biological Section (Helsingør), University of Copenhagen. My PhD project is Bacteriophage control of *Vibrio anguillarum* infections in aquaculture. One of the most important areas which currently I am focusing on is phage and biofilm interaction. So far, numerous of publications have already indicated that most lytic phages can prevent biofilm formation, especially lytic phage cocktail therapy. However, recently there are two publications (Prophage spontaneous activation promotes DNA release enhancing biofilm formation in *Streptococcus pneumoniae* and Phage-induced lysis enhances biofilm formation in *Shewanella oneidensis* MR-1) which demonstrated that lysogenic phages or prophage can somehow promote biofilm formation, which is totally different from lytic phage, since during lysogenic cycle phages kill host release eDNA, which plays an essential role for biofilm formation. Interestingly, one of my phages can promote biofilm formation as well, since we have not done the phage genome sequencing yet. So we still cannot rule out the lysogenic possibility. Further, our hypothesis is, at some point, phage can trigger the bacterial quorum sensing system to protect themselves (A Quorum-Sensing-Induced Bacteriophage Defense Mechanism). Yet we have not proved this hypothesis. In conclusion, that is what I have been doing and why I am taking this biofilm course!

Title of talk:
Bacteriophage control of *Vibrio anguillarum* infections in aquaculture

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Background:
I graduated as a master from Microbiology Department of the Murmansk State Technical University, Russia in 2009. In January 2012 I started working as a PhD student in Marine Biotechnology at the University of Tromsø, Norway. The largely unexplored marine environment is a potential source of unique bioactive compounds with specific mechanisms of action. And the objective of the project is to find and characterize novel marine compound(s) for prevention and treatment of infections with the focus on mode of action of antibacterial and anti-biofilm components.
Therefore I find this course highly relevant to my work. I hope to learn to set up appropriate experimental systems to study biofilm treatment with compounds under test, to perform quantitative analysis of the effect of a certain compound on structure and composition of the biofilm. Furthermore, single-cell techniques could help to investigate and reveal mechanism of action of compounds.
I believe that up-to-date techniques learned within the course will have an application in my further work on the project.

Title of talk:
Novel natural product-inspired compounds – antimicrobial and anti-biofilm studies

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I have conducted my bachelor and master education at DTU in physics and nanotechnology. Currently, I am developing a microsystem with in vitro electrodes for the detection of dopamine exocytosis in cells and brain slices. I got interested in this course because I saw an opportunity of utilizing my system for bacterial application, to allow monitoring of bacterial quorum censing signals. I therefore hope that this course will give me the hands on experience in biofilm techniques.

Title of talk:
Detection of Dopamine Exocytosis of PC12 cells, Neuronal Cells, Astrocytes Cultures and Brain Slices Cutured in an Open Microfluidic System

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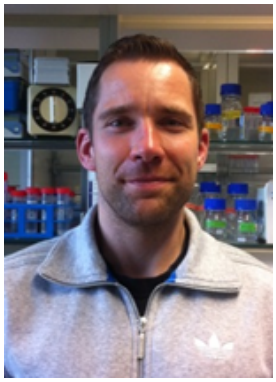

Background:
I did my master thesis in the study course “chemical biology” at the Technical University of Dortmund. Currently I am PhD student at the Biofilm Centre of the University of Duisburg-Essen. My PhD topic is to analyze the stress response to biofilms of the thermoacidophilic archaeon *Sulfolobus acidocaldarius*. For the generation of stress to biofilms I use organic solvents under the aspect of biotechnological applications. Relating to the harsh cultivating conditions (growth temperature of 78 °C and a pH of 3) it is a challenge to cultivate archaeal biofilms. I cultivate *Sulfolobus* biofilms in different static (e.g. microtiter plate and glass slides) and flow-through systems (e.g. tubing system and flow cells). The characterization of biofilms is performed with microscopic techniques, e.g. CLSM, SEM and AFM. First experiments were performed but the microscopic analysis of biofilms was only descriptive. I would like to participate in the course because I intend to extend the microscopic analyses by performing quantitative image analysis and an optimization of different microscopic techniques.

Title of talk:
Stress response in biofilms of the thermoacidophilic archaeon *Sulfolobus acidocaldarius*

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I'm a master student on my 2nd semester. I'm studying biotechnology. I want to follow this course to gain more knowledge and experience in the laboratory. I've done my bachelor in biotechnology at DTU and know the Campus very well. I'm still confused and don't know what I want to work with after my studies, so I'm taking a lot of different courses to make up my mind – but it's still difficult. Since I'm not a PhD student I can only tell you about my bachelor thesis and my special course. The title of my bachelor thesis was: "Production of Pigments in Filamentous Fungi". The thesis and the special project were about extracting some colorants from different fungi in shake flasks and by fermentation.

Title of talk:
Production of Pigments in Filamentous Fungi

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Background:
I hold a masters degree in Pharmaceutical Sciences from the University of Copenhagen, and did my masters degree at the University of Southern Denmark, working on synthetic nucleotide analogues called Locked Nucleic Acids (LNA) for therapeutic oligonucleotide Aptamers. After that I was employed at DTU Nanotech working on diagnostic aptamers for Human Cytomegalovirus and Alzheimer Disease progression. Finally starting my PhD at the University of Queensland in Australia and The Novo Nordisk Foundation Center for Biosustainability, or DTU Biosustain for short.

My PhD focuses on applying RNA aptamers as synthetic switches for turning gene expression ON or OFF, only in the presence of a specific small-molecule metabolite (e.g. amino acid or plant secondary metabolite). The work focuses mainly on automating synthetic switch discovery and employing these switches as screening elements for Bacterial Cell Factories. I am always looking to broaden my experimental repertoire and therefore I applied for participation in this year's course, also all of the techniques and especially the topics are valuable in understanding my screening systems.

Title of talk:
How to turn on a Cell Factory.

Lone Heimann Larsen
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Background:
Ph.D student at Aalborg University Hospital, Department of Clinical Microbiology and Section for Biotechnology at Aalborg University. I am working with prosthetic joint Infection from artificial hips and knees, where we are trying to map the microbial diversity within these infection parallel both optimized culture methods and with molecular approaches. From the culture studies we have large collection of prosthesis related isolates, which we now want to further characterize in different biofilm settings for further exploring of the nature of prosthetic joint infection.

Title of talk:
Prosthetic joint infection – parallel detection of bacteria with culturing and screening for 16S rDNA on different clinical specimens

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Background:
Last year I completed my study of Biochemical Engineering at the TU Dortmund University, focusing on Industrial and Systems Biotechnology.
My study related projects were placed in the context of whole cell biotransformations, i.e. the catalysis of fine or bulk chemicals by means of engineered whole cells. These projects addressed basically two aspects of redox-dependent whole cell biotransformations: (i) how is an unnatural cofactor dependent reaction influencing the cellular metabolism and (ii) how can the metabolism of the cell be altered in order to benefit the cells capability to cope with the burden of the reaction, resulting in higher efficiencies and activities. These questions were investigated by applying systems biotechnological tools as f. ex. MFA/FBA and structural kinetic modeling. In my diploma thesis I worked in the field of secondary metabolism of soil bacteria. By means of proteomics and metabolomics as well as classical screening methodologies the metabolic transition from primary to secondary metabolism, i.e. the onset of the biosynthesis of a secondary metabolite, was investigated.
My PhD project aims to enable the quantitative characterization of microorganisms growing in biofilms. Being able to apply systems biology on biofilms and consequently to characterize the biofilm lifestyle, deeper knowledge of such systems could be gained and further used to identify metabolic targets to engineer new and improved catalytic cells in an biofilm environment.
In order to achieve that, good knowledge about the experimental procedures when dealing with biofilms are essential and the basis for developing systems biotechnological platforms. In this respect, this course will be a great opportunity to learn methods and techniques related to biofilm analysis.

Title of talk:
Towards Systems Biology in Catalytic Biofilms

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Background:
I hold a MSc within food technology (spectroscopy and multivariate data analysis). For seven years I worked at a Danish medical device company called Coloplast, first as scientist within human skin, and hereafter as clinical trial manager, early development at the ostomy care division. Now I am a PhD student at DTU Nanotech, working on a nano-sensor to detect *Pseudomonas aeruginosa* in the breath of cystic fibrosis patients. My co-supervisor is Professor Søren Molin who recommended me to take this course.

Title of Talk:
Development of a sensor for detection of *Pseudomonas aeruginosa* lung infection in the breath of cystic fibrosis patients.

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Background:
I received my Master's Degree in Industrial Biotechnology from the University of Turin (Italy) and in May 2013 I started my PhD project at the Novo Nordisk Foundation Centre for Biosustainability, in the group of Lone Gram.
My project is about the production of novel bioactive compounds through the co-culturing of marina bacteria. In fact, many bacteria are known to produce secondary metabolites with interesting industrial, health or environmental application due to their anti-microbial, anti-oxidant, anti-inflammatory and anti-tumor activities, depending on the compound; the so far poorly characterized marine bacteria represent a great reservoir of such compounds.
In nature, bacteria mostly work in complex communities in the form of biofilms and it is thought that the metabolic profile of a mixed community will not merely be the sum of the profiles belonging to the single strains forming the community, but will show the presence of additional compounds due to the possible cross-talk interactions.
The participation to this course will introduce me to the most important and useful updated tools for the study of biofilm, and this will enable me to get the information that can eventually be merged together with the temporal metabolic profile of the co-cultures in order to make a model about how co-culture can affect the production of secondary metabolites.

Title of talk:
Production of bioactive compound via co-culturing of marine bacteria.

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Background:
I am master student at DTU, studying the in my second semester of Biotechnology master programme . I have been participating in different courses at DTU, mainly in the microbiological field, as my interest goes mostly for that. Due to this, I have been working in microbiological lab.
I like the idea of using biofilm for medical purposes and I am therefore participating in this course. I would like to expand my knowledge within the microbial biofilm techniques. I have not worked that much with biofilm before, but I have participated in a little project concerning biofilm technology for wastewater treatment. The project did not have the technical view but it was more about how to execute the idea of novel wastewater treatment process. I have gained a better understanding of the advantages and disadvantages of biofilm in this field. For now, I want to learn other perspective on the biofilm techniques.

Title of talk:
Perinatal programming of the transcription of genes in hepatic lipid metabolism

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Background:
I have an MSc in biology from the university of Copenhagen. Here I worked under the supervision of Bo Jensen at the Section for Microbiology. My thesis was about initial biofilm-formation in saltwater and freshwater aquariums. Now I am doing my PhD at DTU under the supervision of Lone Gram. The purpose of the project is to facilitate the development of non-antibiotic disease control measures in aquaculture, hence minimizing risk of bacterial antibiotic resistance. The project aims at determining the parameters that influence interaction between fish probiotic bacteria, specifically Roseobacter and the fish pathogenic bacteria Vibrio. These Vibrio antagonizing Roseobacter are often found in biofilm and that is why I would like to participate in the course.

Title of talk:
Probiotic bacteria in marine larvae cultures